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APPLICATION OF ACTIVE LEARNING METHODS IN THE COMPUTER SCIENCE COURSE

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Abstract
The article describes the use of an active learning method based on the use of case assignments. An example of the implementation of the case is described using the example of studying one of the topics of the general computer science course.

Keywords: Active teaching methods, informatics, case-study.

Introduction

The current modernization of education in higher education is associated with the transition from the formation of knowledge to the formation of a certain level of general cultural and professional competencies, the list of which is provided for by the educational standard and depends on the direction of study.

According to [1], “competence is a range of issues in which a specific person has knowledge and experience.” In other words, competence should include a set of knowledge, skills, abilities and methods of activity, set in relation to a certain range of professional activity.

For bachelors in the "Economics" program, in the process of studying the "Computer Science" discipline, the area of general cultural competencies includes knowledge of the basic methods, ways and means of obtaining, storing, processing information, and skills in working with a computer as a means of information management.

The area of professional competencies includes the ability to use modern technical means and information technologies to solve analytical, research and communication problems.

Students can acquire the specified competencies only through relevant experience of activity and communication, and such experience can be obtained in the active learning mode.

Active teaching methods involve transferring the teacher's initiative and activity to the students' activity and initiative, using extensive interaction between students not only with the teacher, but also with each other. The teacher's task in these conditions is to organize the educational process in such a way that it would facilitate the students' initiative. This can be done by issuing appropriate assignments, formulating questions for discussion in groups, encouraging students to use additional sources of information.

One of the active teaching methods is the method of specific situations or the case-study method [2], based on the analysis and solution of practical problems. The solution of practical problems (situations) is based on the theoretical knowledge and previous experience of the student, and also requires the use of his personal qualities, and, consequently, competencies.

The advantages of the case-study method include:

• acquiring skills in analyzing and solving real problems;
• developing skills in simple generalizations;
• acquiring presentation skills.

When studying the discipline "Computer Science", the authors of these lines use three types of educational cases.

1. Cases describing typical situations. The purpose of such a case is to develop simple skills and abilities in solving typical problems of processing economic information.
2. Cases that include complex tasks. The purpose of the case is to reinforce the skills acquired in solving typical problems.
3. Cases that include problem situations. The purpose of the case is independent selection of methods and tools for performing an analysis of a specific situation.

It is obvious that the content and complexity of the case at each level is different: from gaining experience in exercises to analyzing and solving practical problems of great complexity.

The content of the case is selected in accordance with the specific goal:
to develop the ability to apply theoretical knowledge to solve specific practical problems.

When studying the general theoretical part of computer science, the main thing is to master the fundamental concepts of each of its areas, learn to navigate their interrelationships, and acquire skills in practical calculations based on certain theoretical provisions. Their knowledge allows the student to more consciously imagine the processes of processing information, which lays the foundation for the further selection and use of subject-oriented software tools and the formation of professional competencies.

The second type of tasks is related to the technology of information processing on a computer and includes three types of cases.

Since junior students are primarily required to act independently in typical situations, a set of typical tasks is selected. Typical tasks develop simple skills in accordance with the goals of developing professional competence related to the processing and analysis of information. The formulation of these tasks describes in detail the applied technological methods and the sequence of actions.

The next set of tasks are complex tasks. With their help, students master a complex skill based on the simple skills they have formed. Solving complex cases helps develop the ability to independently combine already mastered methods of activity with new ones.

As a result of solving cases containing typical and complex tasks, competencies related to executive independence are formed, which allow the student to perform actions, guided by technological techniques known to him.

In order to develop independence of actions in atypical situations, as well as creative independence, situational or problem tasks are selected. The tasks are individual, described informally and relate to the applied subject area.

Solving problematic tasks requires the student to be able to independently determine the tools for achieving previously formulated research goals.

The result of the study is a report presented in the form of a presentation. At the same time, such qualities as the ability to clearly and distinctly present the main results of the analysis and draw conclusions are formed. The presentation, or presentation of the results of the case

analysis, is a very important aspect of the use of active learning methods. The most important thing in this case is clearly formulating the tasks set and the results obtained.
Let us give an example of the implementation of case assignments when studying the topic "Technology of information processing in spreadsheets".
1. The student is offered a typical case, which describes a typical task for calculating, for example, the salary of an employee of a small enterprise. At the first stage, solving the problem involves simple calculations using percentages, finding sums, average and maximum values. At the second stage, the student is offered to additionally perform calculations related to calculating the employee's bonus and determine the amount of tax and deductions to the pension fund.
Then the task becomes more complex and modified. Situations are offered in which it is necessary to perform calculations using conditional functions, search functions and filtering by various criteria. This case is completed with tasks on summing up intermediate results and using pivot tables.
In addition to the formulated situations, the case includes detailed methodological instructions for solving problems, which indicate which tools should be used and pay special attention to the use of absolute and relative addressing.
Although the tasks of this case are common to all students, they are completed individually by each student, so the teacher has the opportunity to talk to each of them and check the degree of assimilation of the material.
A complex case involves an individual task for each student, which contains a certain situational task related to the work of a small enterprise. The student is asked to solve 4 groups of tasks.
The first group contains questions on the general analysis of the company's work. The second group involves searching for information using various filtering criteria. The third and fourth groups are tasks related to summing up and plotting graphs.
Each part contains tasks, and the student must choose the tools for solving them himself.
By solving this case, students learn to independently overcome the difficulties that arise when choosing the appropriate analysis tool.
Work on the case is structured in such a way that in order to submit the task on time, the student is forced to complete the tasks outside of class hours.
It should be noted that the use of the case method does not replace the generally accepted traditional scheme of presentation of the material: lectures and practical classes, but is organically woven into it, complementing and expanding the capabilities of traditional methods.
When organizing work with a case, a scenario is used, which in principle fits into the traditional lecture scheme of presentation of educational material. The preparatory stage is outside the scenario, and consists of preparing the case. The scenario itself has three stages.
1. Assignment. Depending on the complexity of the task, the case is issued
individually or for the entire group of students.
2. Individual work on the case. The work is done independently, accompanied by consultations, checking the completion of the stages of the work.
3. Submission of the results of the work to the teacher and individual defense of the work.

Before the first stage, a lot of preparatory methodological work is carried out by the teacher, the essence of which is as follows.

• Selection and formulation of the task.

• Methodological development (selection of data sources, examples and other information), commentary on the situation, questions and tasks for working with the case, applications.

We see the following difficulties and problems associated with the use of the case method in the computer science course.

1. How much time does a teacher need to develop a case?
2. How to organize independent work of a student?
3. Where to find time for consultations and checking?

Since modern education is focused not only on obtaining specific knowledge, but also on the formation of professional competence, the development of personal abilities, among which special attention is paid to the ability to self-study, the ability to analyze huge amounts of information, the use of individual cases containing tasks of different types contributes to the consistent and targeted formation of competencies provided for by the training standard.

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